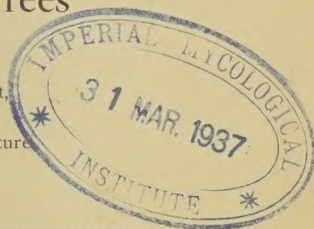


The Control of Mosses and Lichens on Fruit and Nut Trees

By

P. W. MILLER, Associate Pathologist,
Bureau of Plant Industry,
United States Department of Agriculture



Oregon State System of Higher Education
Federal Cooperative Extension Service
Oregon State College
Corvallis
and
Bureau of Plant Industry
United States Department of Agriculture
Cooperating

The Control of Mosses and Lichens on Fruit and Nut Trees

By

P. W. MILLER, Associate Pathologist,
Division of Fruit and Vegetable Crops and Diseases
Bureau of Plant Industry, United States Department of Agriculture

THERE are a number of mosses and lichens that grow on fruit and nut trees in the Pacific Northwest. Although none of these mosses and moss-like growths are parasitic, they may harbor injurious insects of various kinds and may possibly interfere with the normal functioning of the bark. Mosses and lichens should, therefore, not be allowed to become too abundant on trees. Where orchards are regularly sprayed for the control of plant diseases, no special sprays for moss control are required as the fungicides regularly employed for protection against plant diseases are also effective in holding mosses and mosslike growths in check, especially if the limbs and trunks are well covered. When plantings are not regularly sprayed, however, it becomes necessary to apply special sprays at 4- or 5-year intervals to keep mosses and lichens under control. Sometimes an abundance of mosses and mosslike growths indicates lack of vigor or retarded growth from other causes in which case measures other than moss removal will be required to bring the trees back to a normal condition.

The spray materials to use

There are a number of spray materials that will kill mosses and lichens. Lime sulphur and bordeaux mixture are two of the most effective sprays for this purpose. Lime sulphur acts more quickly than bordeaux mixture, but bordeaux mixture is preferable because it has a more lasting effect in keeping the trees free from mosses and mosslike growths. The dead mosses and lichens will persist on the trees for a time after they are killed but will gradually "weather" away.

The proper concentration of the spray

A relatively strong concentration of bordeaux mixture, as 5-5-50 or 6-6-50, is more effective than weaker strengths, although weak concentrations will kill mosses and mosslike growths on trees sprayed at regular intervals. If lime sulphur is used instead of bordeaux mixture, a 12-100 solution (12 gallons of 32° Baumé concentrated liquid lime sulphur added to water to make 100 gallons of spray) should be employed.

When to spray

Spraying must be done in the dormant period of the tree or during intervals in the growing season when injury will not result. Specific directions are as follows:

Fruit trees. Fruit trees may be sprayed for moss control at any time during the dormant period. All leaves should be off the trees when the spray is applied, as it is much easier to saturate thoroughly the mosses and mosslike growths if the trees are bare of foliage.

Filberts. Filberts may be sprayed at any time during the dormant period or in the interval between the end of the staminate (catkin) blooming period and the opening of the leaf buds. The trees should not be sprayed when pollen is being shed as there is a possibility that the spray will interfere with pollination.

Walnuts. Walnuts may be sprayed either in the dormant period or in the early prebloom stage of development when the leaves are unfolded and the pistillate flowers are barely visible on the new growth but before the stigmas (blossom ends) open up. A bordeaux spray applied just before the stigmas open not only will kill the mosses and lichens but will also help to control walnut blight. If the spray is applied at the prebloom stage, either fish (salmon) oil or a heavy mineral spray oil* should be added to bordeaux mixture at the rate of 1 pint of either oil to 100 gallons of spray material in order to reduce leaf burn which frequently follows applications of bordeaux mixture made at this time. Where lime sulphur is used instead of bordeaux mixture the trees should be sprayed only when they are dormant as lime sulphur is very injurious to the tender new growth on walnuts.

If the recommended spray program for the control of walnut blight is followed it will not be necessary to apply any supplementary spray for the control of moss as the growth is killed at the same time the blight is controlled.

Thoroughness of application essential

The mosses and mosslike growths should be thoroughly saturated with spray. To obtain the best results a driving spray applied under high pressure with a spray gun should be employed.

How to make bordeaux mixture

Home-made bordeaux mixture is produced when dilute solutions of copper sulphate (bluestone) and milk of lime are poured together. Formulas are generally designated by the proportions of the materials used. Thus, a 5-5-50 bordeaux mixture would contain the following:

Copper sulphate (bluestone or blue vitrol)....	5 pounds
Quicklime (stone lime or caustic lime)	5 pounds
Water	50 gallons

The first number in the formula always indicates the amount (pounds) of copper sulphate to use. If any considerable amount of bordeaux mixture is to be made it is advisable to prepare separate concentrated stock solutions of copper sulphate and of lime from which the bordeaux mixture may be prepared as needed. A convenient concentration is 1 pound to the gallon of water. These solutions are prepared as follows:

*Mineral oil specifications: Purity test, 50 to 70 sulfonation; viscosity, 100 to 120 seconds Saybolt.

(A) *Copper sulphate solution* may be made by suspending in a 50-gallon barrel of water *near the surface*, 50 pounds of bluestone in a burlap sack. A wooden barrel must be used.

(B) *Lime solution* may be made by slaking 50 pounds of high-grade quicklime (stone or caustic lime) and then adding water to make 50 gallons of the milk of lime.

Preparation

To prepare 50 gallons of the 5-5-50 formula, proceed as follows:

1. Add to the tank about 25 gallons of water and start the agitator.
2. Stir up thoroughly stock solution B and dip out 5 gallons of milk of lime. Pour through a strainer into the spray tank.
3. Arrange a water inlet to the tank so that the water runs down a trough into the tank. Turn on water full force and pour slowly into the running water 5 gallons of stock solution A (copper sulphate) so that it will be diluted as much as possible.
4. As the last portion of bluestone is being poured into the intake water the last of the water to make 50 gallons should have been added.

For more detailed information regarding the preparation of bordeaux mixture consult Oregon Agricultural Experiment Station Bulletin 259, *Sprays, Their Preparation and Use*.

Precautions

1. Use fresh quicklime of highest purity and do not burn or "drown" by adding too little or too much water.
2. Do not mix the concentrated solutions together at any time.
3. Bordeaux mixture should be used immediately after it is prepared. If for some reason the bordeaux can not be used the day it is made, one-eighth ounce of dissolved sugar may be added for each pound of copper sulphate used in making the spray mixture. Thus, for fifty gallons of 5-5-50 bordeaux, five-eighths of an ounce or two and one-half teaspoonfuls of sugar should be used.
4. Clean water should be forced through the spray machine at the end of each day's spraying to avoid corrosion of metal parts by the bordeaux.